

# Exhibit E

**Material Safety Data Sheet**

Version 3.0  
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**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : **Triethanolamine**

Product Number : T1377  
Brand : Sigma-Aldrich

Company : Sigma-Aldrich  
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USA

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**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Synonyms : 2,2',2''-Nitrilotriethanol  
Tris(2-hydroxyethyl)amine

Formula : C<sub>6</sub>H<sub>15</sub>NO<sub>3</sub>  
Molecular Weight : 149.19 g/mol

CAS-No.	EC-No.	Index-No.	Concentration [%]
<b>2,2',2''-Nitrilotriethanol</b>			
102-71-6	203-049-8	-	-

**3. HAZARDS IDENTIFICATION****Emergency Overview****OSHA Hazards**

Delayed target organ effects

Irritant

**Target Organs**

Liver, Kidney

**HMIS Classification**

Health Hazard: 2

Chronic Health Hazard: \*

Flammability: 1

Physical hazards: 0

**NFPA Rating**

Health Hazard: 2

Fire: 1

Reactivity Hazard: 0

**Potential Health Effects**

<b>Inhalation</b>	May be harmful if inhaled. Causes respiratory tract irritation.
<b>Skin</b>	May be harmful if absorbed through skin. Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.
<b>Ingestion</b>	May be harmful if swallowed.

#### 4. FIRST AID MEASURES

##### General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

##### If inhaled

If breathed in, move person into fresh air. If not breathing give artificial respiration. Consult a physician.

##### In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

##### In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

##### If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

#### 5. FIRE-FIGHTING MEASURES

##### Flammable properties

Flash point 179 °C (354 °F) - closed cup

Ignition temperature 316 °C (601 °F)

##### Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

##### Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

#### 6. ACCIDENTAL RELEASE MEASURES

##### Personal precautions

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

##### Environmental precautions

Do not let product enter drains.

##### Methods for cleaning up

Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

#### 7. HANDLING AND STORAGE

##### Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Normal measures for preventive fire protection.

##### Storage

Keep container tightly closed in a dry and well-ventilated place.

hygroscopic

#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

##### Components with workplace control parameters

Components	CAS-No.	Value	Control parameters	Update	Basis
2,2',2''-	102-71-6	TWA	5 mg/m3	1994-09-01	US. American Conference

Nitrioltriethanol

of Governmental and Industrial Hygienists Threshold Limit Values for Chemical Substances in the Work Environment; Annual Reports for the Year 2004; Committees on Threshold Limit Values (TLVs ) and Biological Exposure Indices (BEIs)

### Personal protective equipment

#### Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

#### Hand protection

Handle with gloves.

#### Eye protection

Safety glasses

#### Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

#### Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Appearance

Form viscous  
Colour colourless

### Safety data

pH 10.5 - 11.5 at 149 g/l at 25 °C (77 °F)  
Melting point 17.9 - 21.0 °C (64.2 - 69.8 °F)  
Boiling point 190 - 193 °C (374 - 379 °F) at 7 hPa (5 mmHg)  
Flash point 179 °C (354 °F) - closed cup  
Ignition temperature 316 °C (601 °F)  
Lower explosion limit 1.3 %(V)  
Upper explosion limit 8.5 %(V)  
Density 1.124 g/cm<sup>3</sup>  
Water solubility 149 g/l at 20 °C (68 °F) - completely soluble  
Vapour density 5.15  
- (Air = 1.0)

## 10. STABILITY AND REACTIVITY

### Storage stability

Stable under recommended storage conditions.

### Conditions to avoid

Air Exposure to moisture. Light.

### Materials to avoid

Acids, Oxidizing agents

### Hazardous decomposition products

**Hazardous decomposition products formed under fire conditions.**

Carbon oxides, nitrogen oxides (NOx)

## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

LD50 Oral - mouse - 5,846 mg/kg

Remarks: Behavioral:Convulsions or effect on seizure threshold. Diarrhoea Kidney, Ureter, Bladder:Other changes.

LD50 Dermal - rabbit - > 22.5 g/kg

### Irritation and corrosion

Skin - rabbit - No skin irritation

Eyes - rabbit - Eye irritation

### Sensitisation

no data available

### Chronic exposure

no data available

### Signs and Symptoms of Exposure

Kidney injury may occur., Dermatitis

### Potential Health Effects

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<b>Ingestion</b>	May be harmful if swallowed.
<b>Target Organs</b>	Liver, Kidney,

## 12. ECOLOGICAL INFORMATION

### Elimination information (persistence and degradability)

Biodegradability

### Ecotoxicity effects

Toxicity to fish LC50 - Lepomis macrochirus (Bluegill) - 450 - 1,000 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates. EC50 - Daphnia - 609.98 mg/l - 48 h

### Further information on ecology

no data available

### 13. DISPOSAL CONSIDERATIONS

#### Product

Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

#### Contaminated packaging

Dispose of as unused product.

### 14. TRANSPORT INFORMATION

#### DOT (US)

Not dangerous goods

#### IMDG

Not dangerous goods

#### IATA

Not dangerous goods

### 15. REGULATORY INFORMATION

#### OSHA Hazards

Delayed target organ effects, Irritant

#### TSCA Status

On TSCA Inventory

#### DSL Status

All components of this product are on the Canadian DSL list.

#### SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

#### SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

#### SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

#### Massachusetts Right To Know Components

	CAS-No.	Revision Date
2,2',2"-Nitrilotriethanol	102-71-6	1991-07-01

#### Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2,2',2"-Nitrilotriethanol	102-71-6	1991-07-01

#### New Jersey Right To Know Components

	CAS-No.	Revision Date
2,2',2"-Nitrilotriethanol	102-71-6	1991-07-01

#### California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

### 16. OTHER INFORMATION

#### Further information

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information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Co., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.